UNITED STATES PATENT AND TRADEMARK OFFICE

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09/944,464	08/30/2001	Bradley Stephen Sonksen	ENTRDA.0022P	2838

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EXAMINER
DAVIS, CYNTHIA L

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claim 25 is objected to because of the following informalities: in line 14,

"module" should be changed to "modules". Appropriate correction is required.

2.   Claim 51 is objected to because of the following informalities: in line 6, "forth"

should be changed to "fourth". Appropriate correction is required.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public
use or on sale in this country, more than one year prior to the date of application for patent in the United
States.

3.   Claims 1-13, 16-17, 20-23, 25-28, 30-31, 33-34, and 36-52 are rejected under 35

U.S.C. 102(b) as being anticipated by Ogawa.

Regarding claim 1, a control system for controlling operation of a pipelined

packet processing system having two or more stages, wherein each of the two or more

stages may process a different portion of a packet and packets are being sequentially

processed in the pipeline processing system is disclosed in Ogawa, column 17, line 45

(disclosing a five-step pipeline). A control word bank having two or more locations, the

locations in the control word bank configured to store control words such that each

packet is associated with a control word is disclosed in column 3, lines 52-54 (the

protocol type codes correspond to control words; each packet will have a protocol type

code). A packet counter having an output, the packet counter output comprising an

address to a location in the control word bank is disclosed in column 3, line 60 (the

sequence counter). A byte counter having an output, the byte counter output

comprising an offset in the packet at which processing on the packet is occurring is

disclosed in column 4, line 20 (the frame counter). A control module configured to receive the packet counter output, the byte counter output, and access the control word bank to thereby selectively provide data to at least one stage of the pipelined packet processing system to control processing of the packet in the at least one stage is disclosed in figure 3, element 25A (the multiplexer has access to all of that information).

Regarding claim 2, controlling which portions of the packet are processed is disclosed in column 3, lines 56-57 (the protocol-specific processing would be capable of processing any portion of the packet that is necessary).

Regarding claim 3, accessing control store instructions is disclosed in column 3, line 56 (processing requires instructions). The packet counter and the byte counter are associated with each of the two or more stages is disclosed in column 13, line 55-column 15, line 47 (describing various steps of the pipeline process; the frame and sequence counters are mentioned in several of the steps).

Regarding claim 4, being configured to add, modify or strip data from a packet is disclosed in column 3, lines 18-19 (the system links different types of networks; the packets must have routing data according to a first protocol stripped and replaced with routing data according to a second protocol).

Regarding claim 5, a multiplexer control system comprising multiplexer control logic and multiplexer control instruction memory, wherein control logic is configured to control operation of one or more multiplexers based on the multiplexer control instructions stored in the multiplexer control instruction memory is disclosed in figure 3, element 25A (disclosing a multiplexer) and column 3, lines 56-57 (disclosing protocol-

specific processing, which would involve instructions, in the system using the

multiplexer).

Regarding claim 6, being configured to attach a tag comprised of tag data to the

packet, the tag data being obtained from the control word associated with the packet, a

label, a control store instruction, any combination of the control word, label, or control

store instruction is disclosed in column 3 of Ogawa, lines 44-56 (the protocol type codes

and other routing data used in the system are equivalent to tag data).

Regarding claim 7, the control word bank has a write pointer that is incremented

after each write is disclosed in column 13, line 50 (the object pointer).

Regarding claim 8, a memory configured to store a label, the label being

accessible by the control module is disclosed in column 3 of Ogawa, lines 44-56 (the

protocol type codes and other routing data used in the system are equivalent to tag

data).

Regarding claim 9, a processing location tracking system configured to generate

tracking data regarding which portion of a packet a stage is processing is disclosed in

Ogawa, column 4, line 20 (the frame counter). A control word storage having two or

more storage locations configured to store two or more control words; control word

identification system configured to provide a pointer to a location in the control word

storage is disclosed in column 3, lines 48 and 56-57 (the protocol type code is the

control word). An interface configured to selectively provide tracking data and control

word data stored at a location identified by the pointer to a stage is disclosed in column

3, line 48 and column 4, line 20 (this information is available to the system).

Regarding claim 10, an end of packet monitor configured to reset the processing location tracking system and modify the control word identification system upon detection of an end of a packet is disclosed in column 4, line 20 (the frame counter initializing signal).

Regarding claim 11, a valid data monitoring system configured to enable operation of a stage if the portion of the packet at a stage is valid data is disclosed in column 12, lines 18-34 (disclosing error control in the system).

Regarding claim 12, supplemental data storage in communication with the interface or a stage, the supplemental data storage configured to store supplemental data for use in processing a packet is disclosed in column 3, lines 46-54 (disclosing various types of information associated with a packet that would be stored in some sort of memory).

Regarding claim 13, the tracking system comprises a counter configured to increment with passage of a portion or a part of a portion of a packet and the tracking data comprises an output from the counter is disclosed in column 4, line 20 (the frame counter)

Regarding claim 16, the supplemental data comprises a label for use in generating a tag is disclosed in column 3, lines 44-57 (the packet is modified to include routing information to transform it into whatever protocol is necessary; this may involve generating a tag from a label, depending on the protocols being converted between).

Regarding claim 17, the control word identification system comprises a counter configured to increment upon passage of a packet through a stage is disclosed in column 3, lines 60 (the sequence counter).

Regarding claim 18, a control word comprises data that at least partially controls processing of the packet is disclosed in column 3, lines 48 and 56-57 (the packets are modified in accordance with the protocol type code of the packet).

Regarding claim 20, resetting a counter having an counter output upon detection of a new packet received at the processing module is disclosed in column 4, line 20 (the frame counter initializing signal). Incrementing the counter upon passage of portions of the packet, comparing a portion of control data associated with the packet to the counter output; initiating operation of the processing module if the comparing reveals a match between the portion of the control data and the counter output is disclosed in column 4, lines 9-26 (frame counter indicates which portion of the packet is in which register, i.e., part of the pipeline as it is processed).

Regarding claim 21, the comparing is performed by a hardwired comparator is disclosed in column 4, lines 13-14 (the comparator is part of the system hardware).

Regarding claim 22, the portion of the control data comprises data defining an offset from the start of the packet at which processing on the packet is to occur.

Regarding claim 23, analyzing the packet to determine a packet protocol, and selecting control data based on the packet protocol is disclosed in column 3, lines 56-57.

Regarding claim 25, the method occurs in a plurality of processing modules in a plurality of packet processing pipelines in a packet router is disclosed in the abstract of Ogawa (disclosing a plurality of protocol processing circuits).

Regarding claim 26, incrementing a second counter upon receipt of the new packet, the second counter having an output comprising an address to a memory is disclosed in column 3, line 60 (the sequence counter). Storing the control data in the memory at the address generated by the second counter; and providing the address to the processing module to thereby direct the processing module to the control data associated with the packet being processed by the processing module is disclosed in column 3, line 60-column 4, line 2.

Regarding claim 27, storing a control word at an address defined by a control word selector, the control word being associated with a packet, and storing control store instructions in memory is disclosed in column 3, lines 48 and 56-57 (the protocol type code is the control word, each type code has associated processing instructions). Passing portions of a packet through a dynamic processing module and tracking the passing of portions in relation to an offset from the first portion of the packet is disclosed in column 4, lines 9-25 (the frame counter tracks the portions). Selectively supplementing the packet by adding data from the control word as the packet passes through the dynamic processing module, the supplementing occurring at locations in the packet based on the tracking and the control store instructions is disclosed in column 3, lines 18-19 (the system links different types of networks; the packets must have routing

data according to a first protocol stripped and replaced with routing data according to a second protocol).

Regarding claim 28, the control word selector comprises a counter configured to increment upon receipt of a new packet by the dynamic processing module and the output of the control word selector comprises the address is disclosed in column 3,line 60 (the sequence counter).

Regarding claim 30, tracking comprises resetting a counter upon receipt of a new packet and incrementing the counter as portions of the packet pass through the dynamic processing module is disclosed in column 4, line 20 (the frame counter initializing signal).

Regarding claim 31, the dynamic processing module is implemented in hardware is disclosed in column 3, line 46 (a register is hardware).

Regarding claim 33, the control store instructions control at what offset from the start of the packet the dynamic processing module will generate tag data is disclosed in column 3, lines 56-57 (the protocol specific instructions will dictate where and how the routing information is changed)

Regarding claim 34, receiving the packet at a processing stage in a packet processing pipeline and modifying the output of a tracking system upon receipt of the packet at the processing stage is disclosed in column 4, lines 9-14 (the frame counter tracks the progress of the packet through the pipeline). Storing a control word at one of two or more locations in a control word bank, the one of the two or more locations defined by the output of the tracking system, and providing the tracking system output to

the processing stag, wherein the tracking system output selects which control word the processing stage will use is disclosed in column 3,lines 48, and 56-57 (the protocol type code is the control word; it is chosen by the system).

Regarding claim 36, the processing stage comprises a dynamic processing module or a static processing module is disclosed in column 3, lines 56-57 (the control instructions vary dynamically based on the protocol type of the input packet).

Regarding claim 37, the tracking system comprises a counter associated with the processing stage, the counter configured to increment upon receipt of packet or upon the end of a packet at the processing stage is disclosed in column 4, lines 9-25 (the frame counter).

Regarding claim 38, storing associated packets and control words prior to entry of a packet into the processing pipeline is disclosed in column 3, lines 44-48 (the frame data and protocol type code are stored first).

Regarding claim 39, storing data in a first storage location is disclosed in Ogawa, column 3, line 46 (a register is a location). Reading control data from a first memory and providing the control data to a data processing stage is disclosed in column 3, lines 48 and 56-57 (the control data is the protocol type code). Transmitting data from the first storage location to the data processing stage; processing the data at the data processing stage based on the control data to create processed data; and transmitting the processed data based on the control data to any of a plurality of second storage locations is disclosed in column 4, lines 9-11 (disclosing shift registers that the data moves through as it is processed).

Regarding claim 40, transmitting the processed data is performed by multiplexer is disclosed in figure 3, element 25A.

Regarding claim 41, transmitting the processed data to a second data processing stage, providing second control data to the second data processing stage; processing the processed data with the second data processing stage based on the second control instructions is disclosed in column 17, line 45 (disclosing a five-stage pipeline).

Regarding claim 42, the first and second storage locations comprise data registers is disclosed in column 4, lines 9-11.

Regarding claim 43, means for identifying a portion of a packet that is in a modification system id disclosed in column 4, lines 9-14 (the frame counter tracks the data's progress through the pipeline). Means for identifying a control word for use by the one or more modifications systems, the control word providing data to the one or more modification systems to control operation of the one or more modification system; means for storing the control word is disclosed in column 3, lines 48 and 56-57 (the protocol type code is the control word). Means for interfacing the means for identifying a portion of a packet, means for identifying a control word, and means for storing the control word with one or more modification systems is disclosed in column 3, line 48 and column 4 lines 9-14 (this data is all available to the modification system).

Regarding claim 44, means for detecting an end of a packet, said means for detecting used by the means for identifying a portion of a packet and the means for identifying a control word to account for a new packet is disclosed in column 4, line 20 (frame counter initializing signal).

Regarding claim 45, the means for identifying a portion of a packet and the means for identifying a control word comprises counters is disclosed in column 3, line 60 (sequence counter) and column 4, line 10 (frame counter).

Regarding claim 46, means for inhibiting modification system operation when invalid data is in the modification system is disclosed in column 12, lines 18-34 (disclosing error control in the system).

Regarding claim 47, means for storing a label in communication with the interface, the label comprising data for use in tag generation is disclosed in column 3, lines 44-57 (the packet is modified to include routing information to transform it into whatever protocol is necessary; this may involve generating a tag from a label, depending on the protocols being converted between).

Regarding claim 48, a first memory location configured to store supplemental data, a second memory location configured to store data selector control data, and a third memory location configured to store packet data are disclosed in column 3, lines 44-54. A data selector in communication with the first memory location, the second memory location and the third memory location, the data selector configured to selectively output either packet data or supplemental data based on the data selector control data is disclosed in figure 3, element 25A (the multiplexer) and column 3, lines 56-57 (the packet is modified and output based on the protocol type, i.e., the control word).

Regarding claim 49, the supplemental data comprises data to be associated with the packet data as a tag is disclosed in column 3, lines 44-57 (the packet is modified to

include routing information to transform it into whatever protocol is necessary; this may involve generating a tag from a label, depending on the protocols being converted between).

Regarding claim 50, a buffer configured as a first-in, first-out memory location to store packet data and control data, the buffer further configured to provide stored packet data to the data processing module and provide control data to the first memory location is disclosed in column 4, lines 9-11 (packets and related control data move through the pipeline in the same manner as a FIFO).

Regarding claim 51, fourth memory configured to store additional supplemental data that is communicated to the data selector instead of the supplemental data is disclosed in column 3, lines 46-52 (disclosing various types of data associated with the packet being stored in a memory).

Regarding claim 52, data selector comprises a multiplexer configured to output packet data and supplement data to thereby generate a modified packet is disclosed in figure 3, element 25A.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 14, 15, 19, 29, and 35 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Ogawa.

Regarding claim 14, a portion of a packet comprises four bytes of data is missing

from Ogawa. However, it is generally considered to be within the ordinary skill in the art

to adjust, vary, select, or optimize the numerical parameters or values of any system

absent a showing of criticality in a particular recited value. The burden of showing

criticality is on the applicant (see page 11, line 15, of the instant specification, which

states that the system "may" use a 4-byte register to store the packet portion). In re

Mason, 87 F2d 370, 32 USPQ 242 (CCPA 1937).

Regarding claim 15, a portion of a packet comprises two or more bytes of data

and a part of a portion comprises a byte of data is missing from Ogawa. However, it is

generally considered to be within the ordinary skill in the art to adjust, vary, select, or

optimize the numerical parameters or values of any system absent a showing of

criticality in a particular recited value. The burden of showing criticality is on the

applicant (see page 11, line 15, of the instant specification, which states that the system

"may" use a 4-byte register to store the packet portion; this argues against the criticality

of a two-byte portion). In re Mason, 87 F2d 370, 32 USPQ 242 (CCPA 1937).

Regarding claim 19, the control word is 144 bytes in size is missing from Ogawa.

However, it is generally considered to be within the ordinary skill in the art to adjust,

vary, select, or optimize the numerical parameters or values of any system absent a

showing of criticality in a particular recited value. The burden of showing criticality is on

the applicant. In re Mason, 87 F2d 370, 32 USPQ 242 (CCPA 1937).

Regarding claim 29, a portion comprises a byte is missing from Ogawa. However, it is generally considered to be within the ordinary skill in the art to adjust, vary, select, or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on the applicant (see page 11, line 15, of the instant specification, which states that the system "may" use a 4-byte register to store the packet portion; this argues against the criticality of a one-byte portion). In re Mason, 87 F2d 370, 32 USPQ 242 (CCPA 1937).

Regarding claim 35, more than one processing stage concurrently utilizes the same control word due to the packet being concurrently processed by more than one processing stage is disclosed in column 3, lines 56-57 (the same control word is used for each packet throughout the system), and column 4, lines 9-11 (disclosing shift registers that portions of the packet move through). The control word comprises between 1 byte and 2048 bytes of data is missing from Ogawa. However, it is generally considered to be within the ordinary skill in the art to adjust, vary, select, or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on the applicant. In re Mason, 87 F2d 370, 32 USPQ 242 (CCPA 1937).

5.   Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa in view of Braun.

Regarding claim 24, the packet protocol consists of 1Pv4, Diffserve 1Pv4, and 1Pv6 is missing from the network protocol converting system of Ogawa (see Ogawa, column 3, lines 18-19). However, Braun discloses in the abstract on page 472, IPv4,

IPv6, and DiffServe IPv4. It would have been obvious to one skilled in the art at the time of the invention to have the system of Ogawa convert between IPv4, IPv6, and DiffServe IPv4. The motivation would be to link together networks that use well-known protocols.

6.   Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa in view of Tappan.

Regarding claim 32, the tag is an MPLS type tag is missing from Ogawa. However, Tappan discloses in column 2, line 60, MPLS as a type of routing data for a packet-switching network. It would have been obvious to one skilled in the art at the time of the invention to use MPLS tags in the protocol-converting system of Ogawa. The motivation would be to be able to convert packets from a system using MPLS, which is a well-known protocol.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia L Davis whose telephone number is (571) 272-3117. The examiner can normally be reached on 8:30 to 6, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
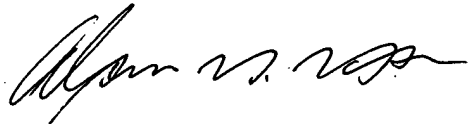
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CLD
3/7/2005

ALPUS H. HSU
PRIMARY EXAMINER